MODUL
PERKEMBANGAN PEMBELAJARAN
SPM 2019

MPP 3

FIZIK
KERTAS 1

NAMA : .....

KELAS : .....

DIBIAYAI OLEH KERAJAAN NEGERI TERENGGANU

MAKLUMAT UNTUK CALON

1. *Kertas soalan ini mengandungi 50 soalan.*
2. *Jawab* **semua** *soalan.*
3. *Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan.*
4. *Bagi setiap soalan hitamkan satu ruangan sahaja.*
5. *Sekiranya anda hendak menukarkan jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.*
6. *Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.*
7. *Senarai rumus disediakan di halaman 3.*
8. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.*

INFORMATION FOR CANDIDATES

1. *This question paper consists of 50 questions.*
2. *Answer* ***all*** *questions.*
3. *Answer each question by blackening the correct space on the answer sheet.*
4. *Blacken only* ***one*** *space for each question.*
5. *If you wish to change your answer, erase the blackened mark that you have made. Then blacken the space for the new answer.*
6. *The diagrams in the question provided are not drawn to scale unless stated.*
7. *You may use a non-programmable scientific calculator.*
8. *A list of formula is provided on page 3.*

The following information may be useful. The symbols have their usual meaning.
Maklumat berikut mungkin berfaedah. Simbol-simbol mempunyai makna yang biasa.

1. $a = \frac{v-u}{t}$
2. $s = ut + \frac{1}{2}at^2$
3. $v^2 = u^2 + 2as$
4. Momentum = mv
5. $F = ma$
6. $F = kx$
7. Gravitational potential energy = mgh
8. Kinetic energy = $\frac{1}{2}mv^2$
9. Elastic potential energy = $\frac{1}{2}Fx = \frac{1}{2}kx^2$
10. g = 10 m s^{-2}
11. $\rho = \frac{m}{v}$
12. Pressure, $P = \frac{F}{A}$
13. Heat, Q = mcΘ
14. $\frac{pV}{T} = cons\tan t$
15. E = mc^2
16. $v = f\lambda$
17. Power, $P = \frac{energy}{time}$

    Kuasa, $P = \frac{tenaga}{masa}$
18. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$
19. $\lambda = \frac{ax}{D}$
20. $n = \frac{\sin i}{\sin r}$, $n = \frac{1}{\sin c}$
21. $n = \frac{real\ \ depth}{apparent\ \ depth}$
22. Q = It
23. V = IR
24. Power / Kuasa, P = IV

    Power / Kuasa, $P = \frac{V^2}{R}$
25. $\frac{N_s}{N_p} = \frac{V_s}{V_p}$
26. Efficiency / Kecekapan
    $= \frac{I_s V_s}{I_p V_p} \times 100\%$
27. c = 3.0 x 10^8 m s^{-1}

1. Which of the following values is equal to 300 ms?
Antara nilai berikut,yang manakah sama dengan 300 ms*?*

A 3×10^{-5} s

B 3×10^{-4} s

C 3×10^{-3} s

D 3×10^{-1} s

2 Which quantity is a scalar quantity?
Kuantiti manakah yang merupakan kuantiti scalar?

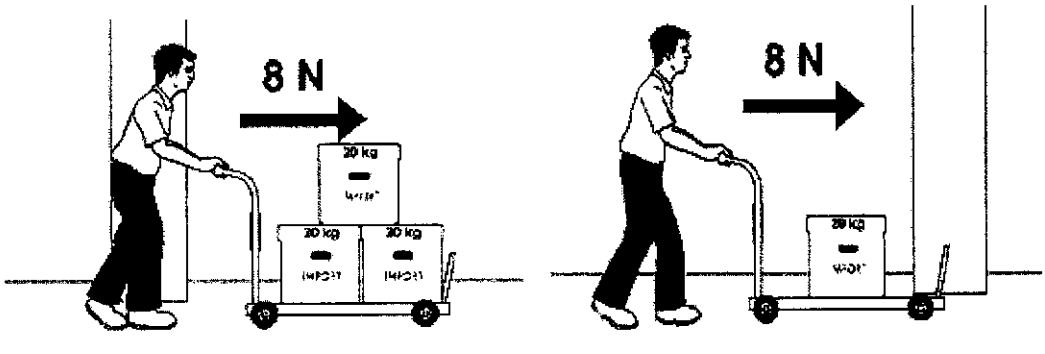
A Potential difference
Beza keupayaan

B Velocity
Halaju

C Momentum
Momentum

D Force
Daya

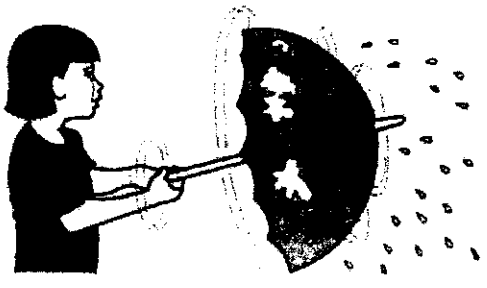
3. Diagram shows an investigation about the effect of force on the motion of objects. Trolleys of different masses are pushed by the same amount of force.
Rajah menunjukkan satu penyiasatan tentang kesan daya terhadap gerakan objek. Troli yang berlainan jisim ditolak oleh jumlah daya yang sama.



Which of the following variables are correct?
Antara pembolehubah berikut, yang manakah betul?

	Manipulated variable ***Pembolehubah dimanipulasikan***	**Responding variable** ***Pembolehubah bergerak balas***	**Constant variable** ***Pembolehubah dimalarkan***
A	Mass *Jisim*	Force exerted *Daya dikenakan*	Acceleration *Pecutan*
B	Force exerted *Daya dikenakan*	Mass *Jisim*	Acceleration *Pecutan*
C	Acceleration *Pecutan*	Force exerted *Daya dikenakan*	Mass *Jisim*
D	Mass *Jisim*	Acceleration *Pecutan*	Force exerted *Daya dikenakan*

4. Diagram shows a girl rolling an umbrella to remove the rain droplets.
Rajah menunjukkan seorang gadis sedang memutarkan payung untuk menyingkirkan titisan air hujan.



What is the physics concept involved in the above situation?
Apakah konsep fizik yang terlibat dalam situasi di atas?

A Momentum
Momentum

B Inertia
Inersia

C Deceleration
Nyahpecutan

D Impulse
Impuls

5. A force is applied to an object. Which of the following will not occur?
Daya dikenakan ke atas suatu jasad. Antara yang berikut, yang manakah tidak akan berlaku?

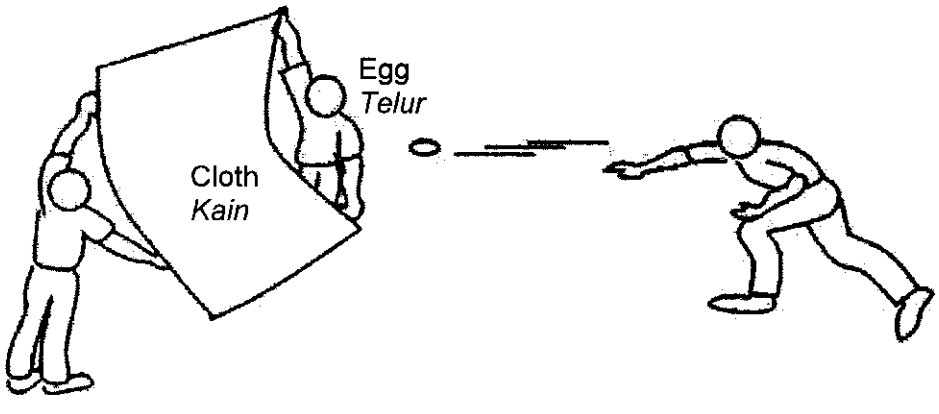
A The object speeds up
Jasad semakin laju

B The shape of the object changed
Bentuk jasad berubah

C The mass of the object decreases
Jisim jasad berkurang

D The object changes its direction of motion
Arah gerakan jasad berubah

6. Diagram shows a student throws an egg towards a piece of cloth that supported by two of his friends.
Rajah menunjukkan seorang pelajar sedang melontar telur ke arah sehelai kain yang dipegang oleh dua orang rakannya.



Which of the following explained why the egg doesn't break?
Antara yang berikut, yang manakah menerangkan mengapa telur itu tidak pecah?

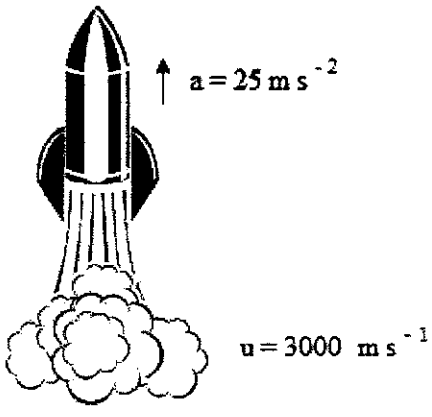
A Both the cloth and the egg shell are made of soft material
Kedua-dua kain dan kulit telur dibuat dari bahan yang lembut

B The egg has negligible momentum
Telur itu mempunyai momentum yang boleh diabaikan

C The cloth lengthen the impact time so impulsive force is reduced
Kain itu memanjangkan masa perlanggaran maka daya impuls dikurangkan

D The cloth shorten the impact time so impulsive force is reduced
Kain itu memendekkan masa perlanggaran maka daya impuls dikurangkan

7. Diagram shows a rocket starts at velocity 3000 m s^{-1} and accelerates uniformly upwards at 25 m s^{-2} .
Rajah menunjukkan sebuah roket bermula dengan halaju 3000 m s^{-1} *dan kemudiannya memecut seragam pada* 25 m s^{-2} *ke atas.*



What is the velocity of the rocket after 5 minutes?
Berapakah halaju roket selepas 5 *minit?*

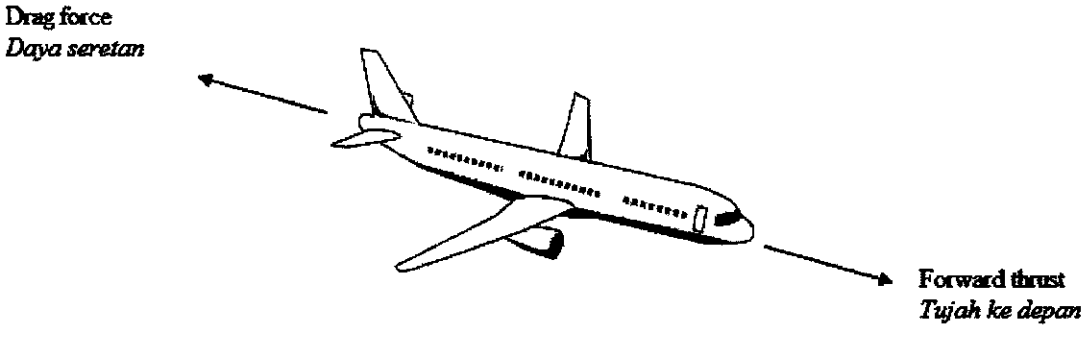
A - 4 500 m s^{-1}

B - 10 500 m s^{-1}

C 2 875 m s^{-1}

D 10 500 m s^{-1}

8. Diagram shows an airplane is flying at a certain height and constant velocity.
Rajah menunjukkan sebuah kapal terbang terbang pada ketinggian tertentu pada halaju seragam.



The forces are balanced when
Daya-daya adalah seimbang apabila

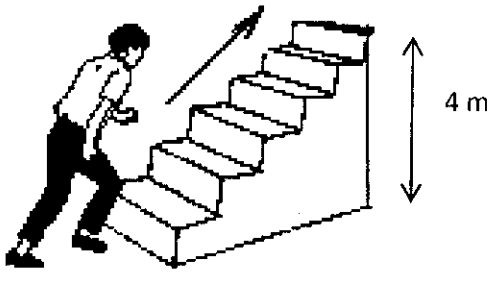
A net force is zero
daya bersih adalah sifar

B net force is more than frictional force
daya bersih adalah lebih besar daripada daya geseran

C net force is equal to frictional force
daya bersih sama dengan daya geseran

D net force is less than frictional force
daya bersih kurang daripada daya geseran

9. Diagram shows a student with mass 70 kg climbing stairs at a height of 4 m.
Rajah menunjukkan seorang pelajar dengan jisim 70 kg *memanjat tangga pada ketinggian* 4 m.



What is the work done by him to rise up?
Apakah kerja yang dilakukan oleh lelaki itu untuk naik ke atas?

A 280 J

B 700 J

C 2800 J

D 28000 J

10. The relationship between strectching force, F, with the extension, x, of a spring, is given by the equation:
Hubungan antara daya regangan, F dengan pemanjangan, x satu spring diberi oleh persamaan:

$$F = kx$$

Where *k* is the constant. What is the unit S. I of *k*?
Di mana k ialah pemalar. Apakah unit S. I bagi k?

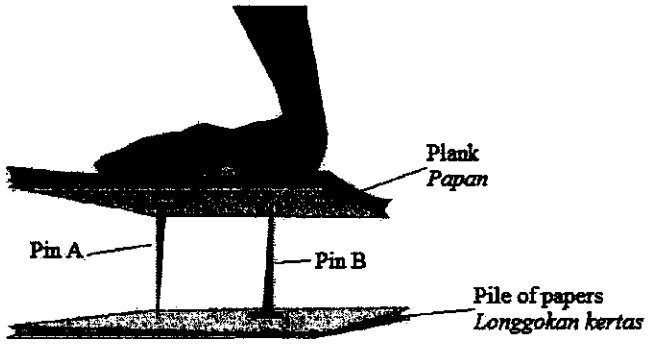
A $N\ cm^{-1}$

B $kg\ cm^{-1}$

C $kg\ m^{-1}$

D $N\ m^{-1}$

11. Diagram shows Ahmad is pressing two identical pins, A and B which are placed in between a plank and a pile of papers. Both pins are placed next to each other with two different ways.
Rajah menunjukkan Ahmad sedang menekan dua pin yang serupa diletakkan diantara sekeping papan dan satu longgokan kertas. Kedua pin itu diletakkan sebelah menyebelah dengan dua kaedah yang berlainan.



Ahmad found that pin A able to penetrate the papers due to
Ahmad mendapati pin A boleh menembusi kertas disebabkan oleh

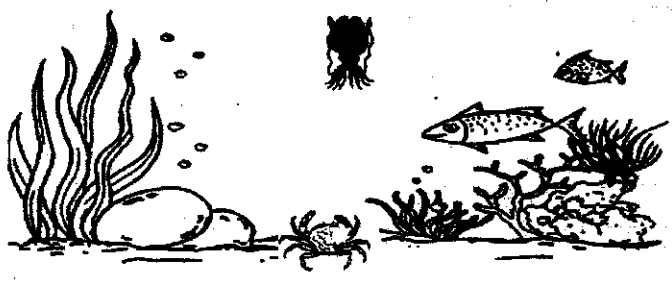
A The surface area of pin A in contact with the papers is larger
Luas permukaan pin A yang bersentuhan dengan kertas adalah lebih besar

B The pressure exerted by pin A on the papers is larger
Tekanan yang dikenakan oleh pin A adalah lebih besar

C Force exerted by pin A on the papers is larger
Daya yang dikenakan oleh pin A ke atas kertas adalah lebih besar

D The surface area of pin A in contact with the plank is larger
Luas permukaan pin A yang bersentuhan dengan papan lebih besar

12. Diagram shows a cuttlefish and a crab.
Rajah menunjukkan seekor sotong dan ketam.



The crab experiences larger pressure than the cuttlefish because
Ketam mengalami tekanan yang lebih tinggi daripada sotong kerana

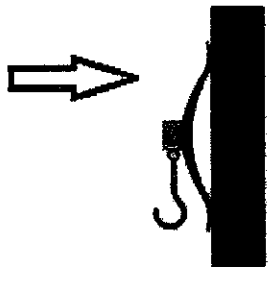
A the crab has a larger weight than the cuttlefish
ketam lebih berat daripada sotong

B the depth of the water at the position of the crab is greater than the position of the cuttlefish
kedalaman air bagi kedudukan ketam melebihi kedudukan sotong

C the density of water surrounding the crab is greater than the density of the water surrounding the cuttlefish
ketumpatan air yang dialami oleh ketam melebihi ketumpatan air yang dialami oleh sotong

D the buoyant force acting on the crab is larger than the buoyant force acting on the cuttlefish
Daya keapungan yang bertindak keatas ketam adalah lebih besar daripada daya keapungan yang bertindak ke atas sotong

13. Diagram shows a rubber sucker is pressed against a smooth wall.
Rajah menunjukkan penyedut getah ditekan kepada dinding yang licin.



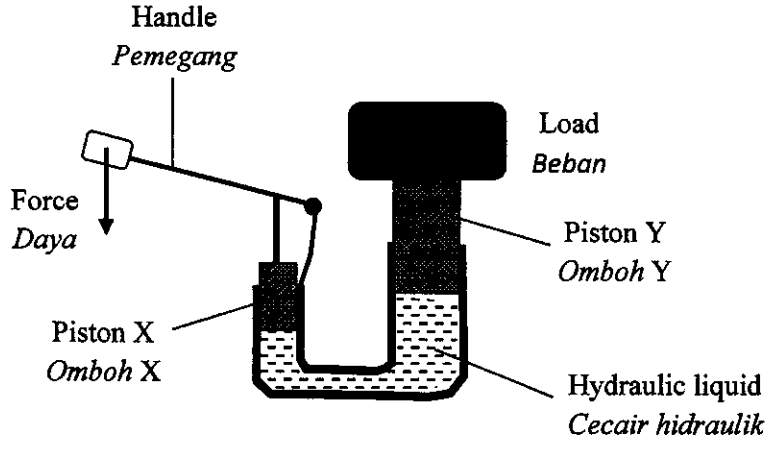
Rubber sucker is attached to the wall because
Penyedut getah melekat pada dinding kerana

A the atmospheric pressure is equal to the pressure inside the rubber sucker
tekanan atmosfera sama dengan tekanan di dalam penyedut getah

B the atmospheric pressure is less than the pressure inside the rubber sucker
tekanan atmosfera lebih rendah daripada tekanan di dalam penyedut getah

C the atmospheric pressure is more than the pressure inside the rubber sucker
tekanan atmosfera lebih tinggi daripada tekanan di dalam penyedut getah

14. Diagram shows a simple hydraulic jack.
Rajah menunjukkan satu jek hidraulik ringkas.



The jack can lift a heavier load using the same force by
Jek tersebut dapat mengangkat beban yang lebih berat dengan menggunakan daya yang sama dengan

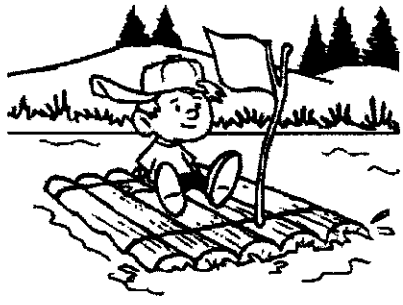
A shortening the length of the handle.
memendekkan panjang pemegang.

B increasing the vertical length of piston X.
menambahkan panjang menegak omboh X.

C increasing the cross-sectional area of piston Y.
menambahkan luas keratan rentas omboh Y.

D using a hydraulic liquid of higher density.
menggunakan cecair hidraulik yang berketumpatan lebih tinggi.

15. Diagram shows a boy in a raft.
Rajah menunjukkan seorang budak di atas rakit.



If the weight of the boy and the raft is 1200 N, what is the volume of the raft which is submerged?
Jika berat budak dan rakitnya ialah 1200 N, *apakah isipadu bahagian rakit yang tenggelam?*
[Density of water = 1000 kg m $^{-3}$]
[Ketumpatan air = 1000 kg m $^{-3}$*]*

A 0.12 m^3

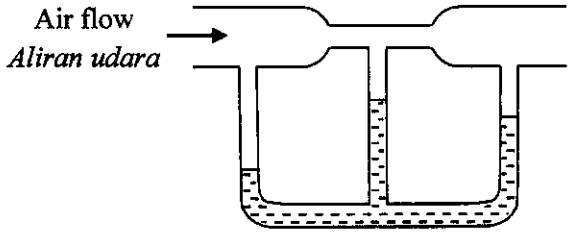
B 0.83 m^3

C 1.20 m^3

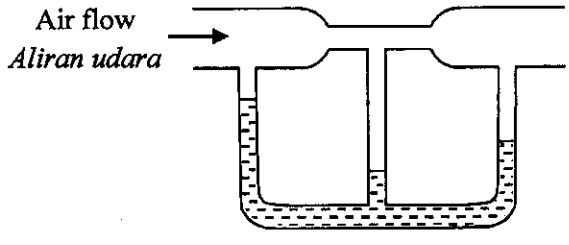
D 8.33 m^3

16. Which diagram shows the correct liquid level in the U-tube?
Rajah manakah menunjukkan aras cecair yang betul di dalam tiub-U?

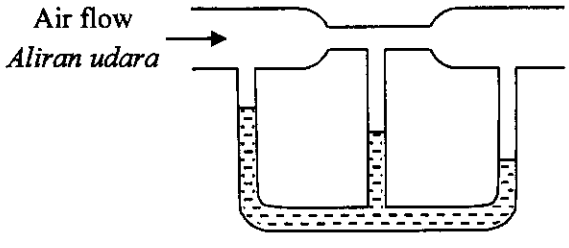
A



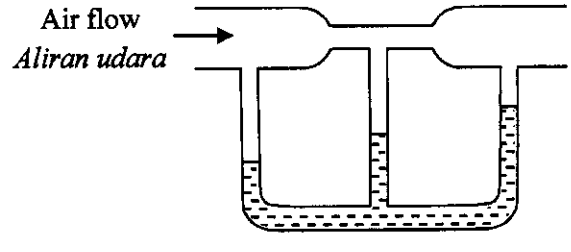
B



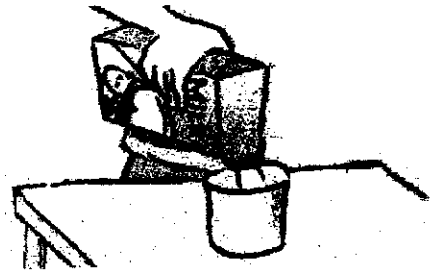
C



D



17. Diagram shows cold milk being poured into hot coffee.
Rajah menunjukkan susu sejuk dituangkan ke dalam kopi panas.



Which statement is correct when the mixture is at the thermal equillibrium?
Pernyataan manakah yang betul apabila campuran itu berada dalam keadaan keseimbangan terma?

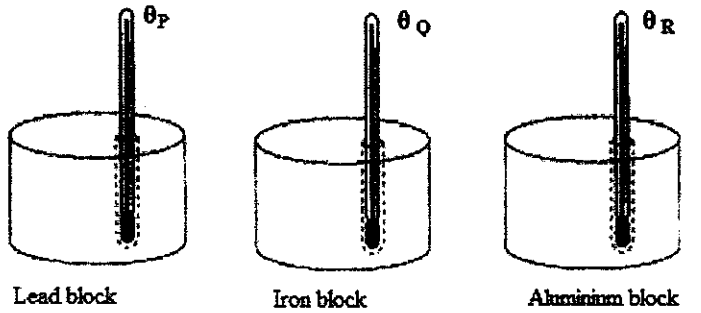
A Temperature of mixture is lower than cold milk
Suhu campuran itu lebih rendah daripada suhu susu sejuk

B Temperature of mixture is higher than hot coffee
Suhu campuran itu lebih tinggi daripada suhu kopi panas

C Net rate of heat transfer of the cold milk is lower than the hot coffee
Kadar pemindahan haba susu sejuk adalah lebih rendah daripada kopi panas

D Net rate of heat transfer between the cold milk and the hot coffee is zero
Kadar pemindahan haba bersih antara susu sejuk dan kopi panas adalah sifar

18. Diagrams shows a lead block, an iron block and aluminium block. All the blocks has the same mass and same initial temperature and let to be cold. All the blocks have different specific heat capacity, c. After 15 minutes the temperature of the blocks are recorded.
Rajah menunjukkan satu blok plumbum, satu blok besi dan satu blok aluminium. Semua blok itu mempunyai jisim dan suhu awal yang sama dan dibiarkan menyejuk. Ketiga-tiga logam itu mempunyai muatan haba tentu, c yang berbeza. Selepas 15 minit suhu ketiga-tiga logam itu di rekodkan.



Lead block
Blok plumbum
$c = 130\ J\ kg^{-1}\ °C^{-1}$

Iron block
Blok besi
$c = 460\ J\ kg^{-1}\ °C^{-1}$

Aluminium block
Blok aluminium
$c = 910\ J\ kg^{-1}\ °C^{-1}$

Which comparison is correct about the temperature of lead block, θ_P, iron block, θ_Q, and aluminium block, θ_R is correct?
Perbandingan yang manakah betul tentang suhu bagi blok plumbum, θ_P, blok besi, θ_Q, dan blok aluminium, θ_R?

A $\theta_P > \theta_Q > \theta_R$

B $\theta_Q > \theta_P > \theta_R$

C $\theta_R > \theta_P > \theta_Q$

D $\theta_R > \theta_Q > \theta_P$

19. 5400 J of heat is used to increase the temperature of 0.8 kg metal block. The specific heat capacity of the metal block is 450 J $kg^{-1}{}^{o}C^{-1}$. What is the rise in temperature of the metal block?
5400 J *haba digunakan untuk meningkatkan suhu sebuah blok logam berjisim* 0.8 kg. *Muatan haba tentu blok logam itu ialah* 450 J $kg^{-1}{}^{o}C^{-1}$.*Berapakah peningkatan suhu blok logam itu?*

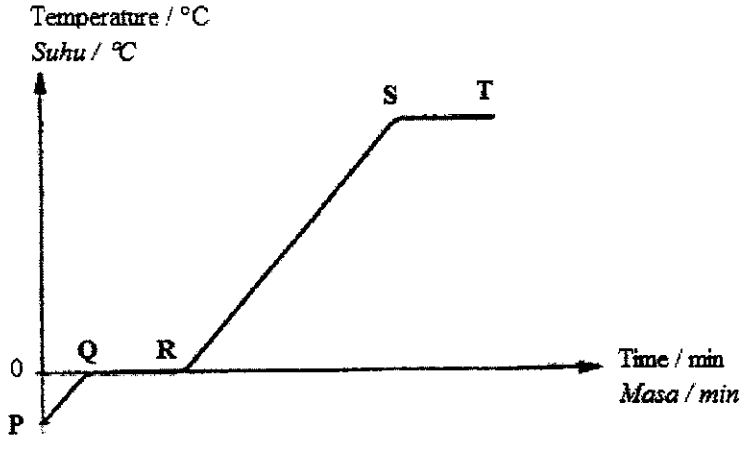
A 9.6 °C

B 12.0 °C

C 15.0 °C

D 360.0 °C

20. Diagram shows the heating curve of a substance.
Rajah menunjukkan lengkung pemanasan suatu bahan.



Which statement is correct about the heat absorbed by the substance?
Pernyataan manakah betul tentang haba yang diserap oleh bahan itu?

	Stages *Peringkat*	Statement *Pernyataan*
A	PQ	It strengthen the bonds between the substance molecules *Menguatkan ikatan antara molekul bahan*
B	QR	It breaks the bonds between the substance molecules *Memutuskan ikatan antara molekul bahan*
C	RS	It decreases the kinetic energy of the substance molecules *Menurunkan tenaga kinetik molekul bahan*
D	ST	It weakens the forces between the substance molecules *Melemahkan daya antara molekul bahan*

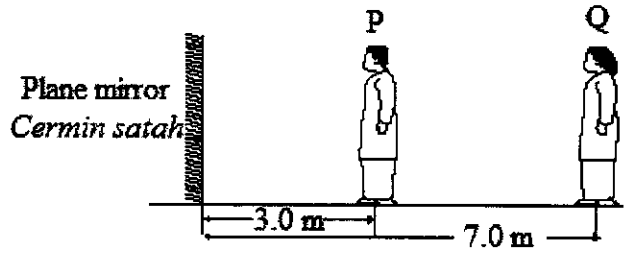
21. After a long journey the air pressure in a car tyre is increased. This can be explain by
Selepas satu perjalanan yang jauh, tekanan udara di dalam kereta akan bertambah. Ini dapat diterangkan oleh

A Boyle's law.
Hukum Boyle.

B Charles' law.
Hukum Charles.

C Pressure's law.
Hukum Tekanan.

22. Diagram shows student P and student Q standing in front of a plane mirror at a distance of 3.0 m and 7.0 m respectively.
Rajah menunjukkan pelajar P dan pelajar Q berdiri di hadapan sebuah cermin satah pada jarak 3.0 m *dan* 7.0 m *masing-masing.*



What is the distance between student Q and the image student P?
Apakah jarak antara pelajar Q dengan imej pelajar P?

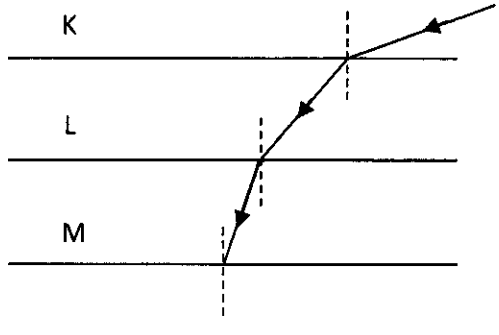
A 4.0 m

B 10.0 m

C 13.0 m

D 14.0 m

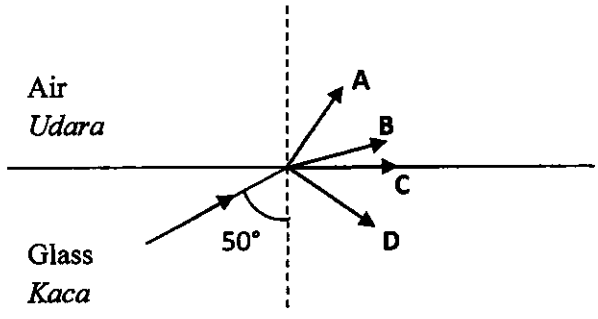
23. Diagram shows a light ray passing through three different media, K, L and M.
Rajah menunjukkan satu sinar cahaya merambat melalui tiga medium yang berlainan, K, L *dan* M.



Which of the following shows the correct comparison of the refractive indices n_K, n_L, and n_M of the three media?
Antara yang berikut, yang manakah menunjukkan perbandingan yang betul bagi indeks biasan, n_K, n_L, *dan* n_M *bagi tiga medium itu?*

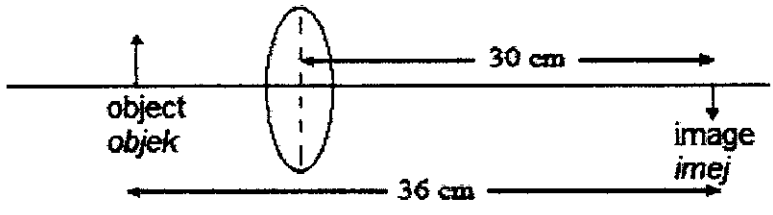
A $n_L > n_K > n_M$
B $n_M > n_L > n_K$
C $n_L > n_M > n_K$
D $n_M < n_K < n_L$

24. Diagram shows a light ray travelling from glass to air. The critical angle of glass is 44°.
Rajah menunjukkan satu sinar cahaya bergerak dari kaca menuju ke udara. Sudut genting kaca ialah 44°.



Which of the following paths, **A**, **B**, **C** or **D**, shows the correct path of the light ray?
Antara lintasan **A**, **B**, **C** *dan* **D**, *yang manakah menunjukkan lintasan sinar cahaya yang betul?*

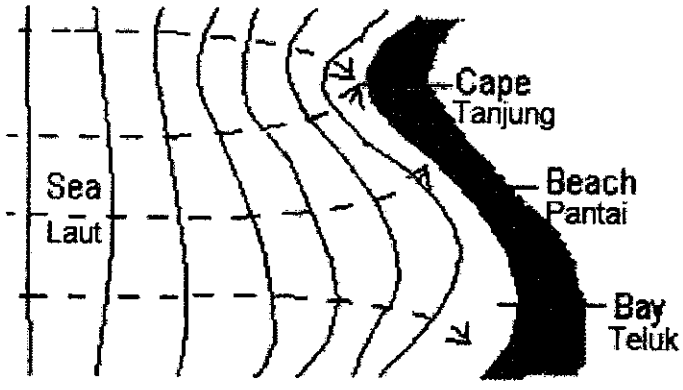
25. Diagram shows the formation of the image of an object by a convex lens.
Rajah menunjukkan pembentukan imej satu objek oleh satu kanta cembung.



What is focal length of the lens?
Berapakah jarak fokus bagi kanta?

A 0.2 cm
B 1.2 cm
C 5.0 cm
D 6.0 cm

26. The diagram shows wave fronts that move towards the beach from the sea. It is observed that the sea is calmer at the bay than at the cape.
Gambar rajah menunjukkan muka gelombang merambat menuju pantai dari laut. Adalah diperhatikan laut lebih tenang di teluk berbanding di tanjung.



The phenomenom seen in diagram is
Fenomena yang kelihatan dalam gambar rajah ialah

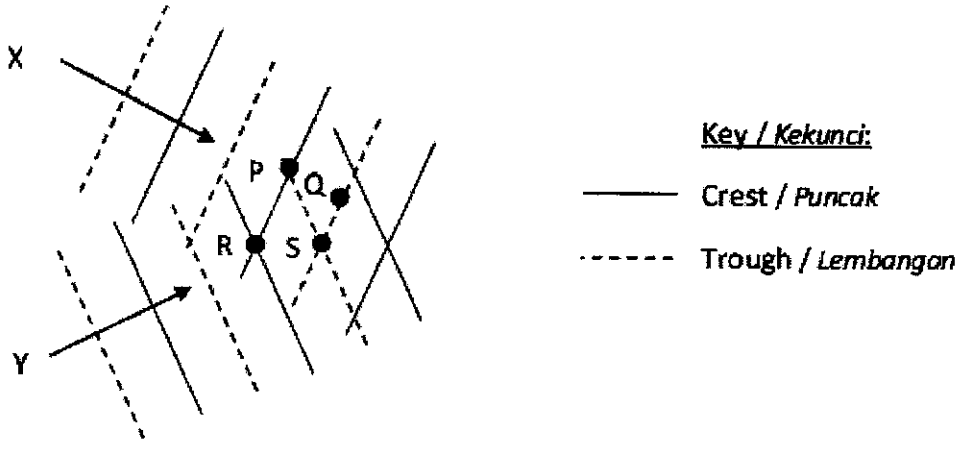
A refraction
pembiasan

B interference
Interferens

C reflection
pantulan

D difraction
pembelauan

27. Diagram shows the superposition of two coherent water waves, X and Y.
Rajah menunjukkan superposisi bagi dua gelombang air yang koheren, X dan Y.



At which points do constructive interference occur?
Di titik-titik manakah interferens membina berlaku?

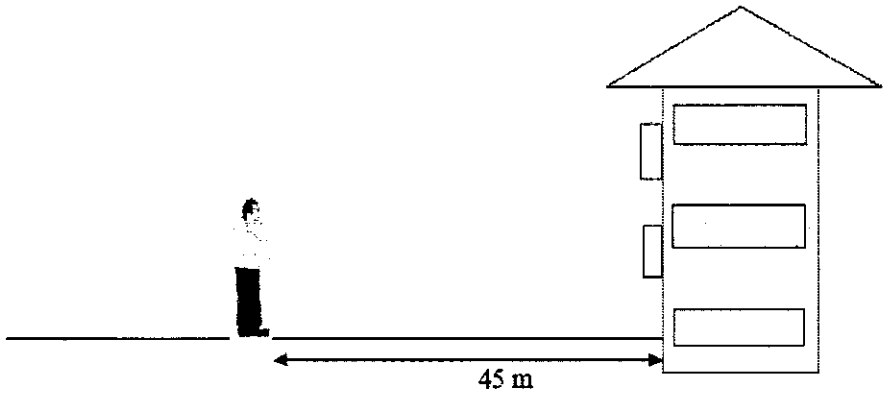
A P and Q
P *dan* Q

B Q and R
Q *dan* R

C R and S
R *dan* S

D P and S
P *dan* S

28. Diagram shows a boy shouting at a school building.
Rajah menunjukkan seorang budak lelaki menjerit ke arah bangunan sekolah.



Calculate the time taken by the boy to hear the echo of his voice.
Hitung masa yang diambil oleh budak lelaki tersebut untuk mendengar gema suaranya.
[The speed of sound in air is 340 m s^{-1}]
[Laju bunyi di udara ialah 340 m s^{-1}*]*

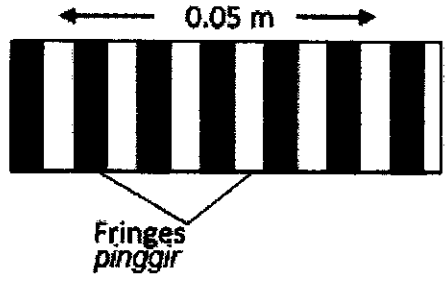
A 0.07 s

B 0.13 s

C 0.26 s

D 3.78 s

29. Diagram shows a fringe pattern formed on a screen in Young's double-slit experiment.
Rajah menunjukkan corak pinggir yang dihasilkan di atas skrin dalam eksperimen dwicelah Young.



The distance between double slit and screen is 1 m and the wavelength of light is given as 5×10^{-7} m. What is the distance between two slits?
Jarak di antara dwicelah dan skrin ialah 1 m *dan panjang gelombang cahaya yang digunakan ialah* 5×10^{-7} m. *Berapakah jarak di antara dua celah?*

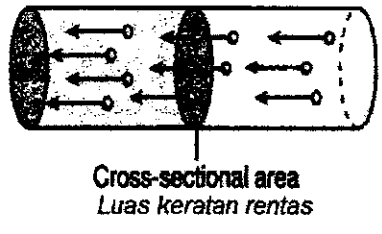
A 5.0×10^{-5} m

B 1.0×10^{-5} m

C 5.0×10^{-3} m

D 1.0×10^{-3} m

30. The diagram shows free electrons flowing in a conductor. A total of 2.50×10^{19} electrons pass through the cross-sectional area in 5.0 seconds.
Gambar rajah menunjukkan elektron-elektron bebas mengalir dalam konduktor. Sebanyak 2.50×10^{19} *elektron mengalir melalui luas keratan rentas dalam masa* 5.0 *saat.*
[Charge carried by one electron, $e = 1.6 \times 10^{-19}$ C]
[Cas bagi suatu elektron, $e = 1.6 \times 10^{-19}$ C*]*



What is the current in the conductor?
Apakah nilai arus dalam konduktor?

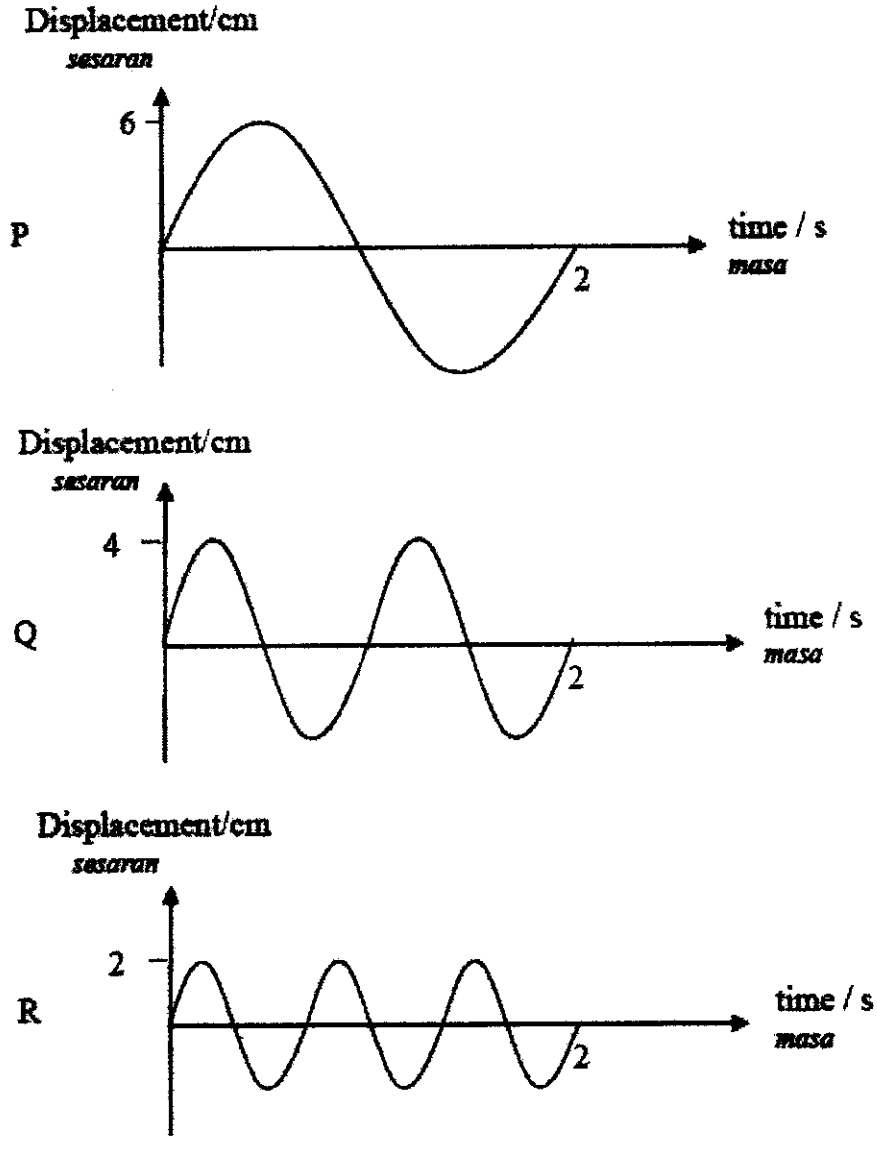
A 0.40 A

B 0.64 A

C 0.80 A

D 2.00 A

31. Diagram shows the displacement-time graph for wave **P**, **Q** and **R**.
*Rajah menunjukkan graf sesaran-masa bagi gelombang **P**, **Q** dan **R**.*



Arrange the waves **P**, **Q** and **R** from the highest to the lowest pitch.
*Susun gelombang **P**, **Q** and **R** berdasarkan kelangsingan dari tinggi ke rendah.*

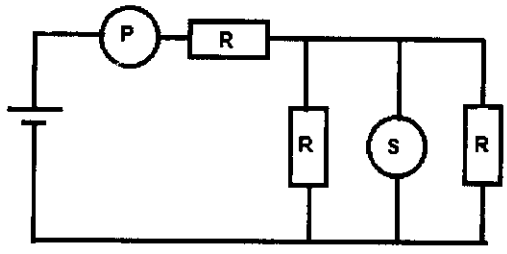
A P, Q, R

B R, Q, P

C Q, R, P

D P, R, Q

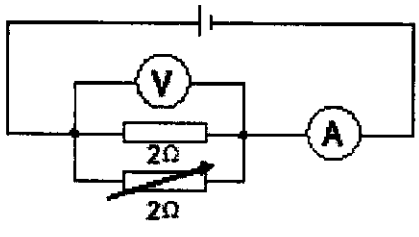
32. The diagram shows a circuit with three similar resistors , R and two measuring instruments P and S.
Rajah menunjukkan litar elektrik yang mengandungi tiga perintang yang serupa R *dan dua alat pengukur* P *dan* S.



What is P and S?
Apakah P *dan* S*?*

	P	S
A	Ammeter	Ammeter
B	Voltmeter	Voltmeter
C	Ammeter	Voltmeter
D	Voltmeter	Ammeter

33. Diagram shows an electrical circuit.
Rajah menunjukkan satu litar elektrik.



When the resistance of the variable resistor is increased,
Apabila rintangan bagi perintang boleh laras ditambah,

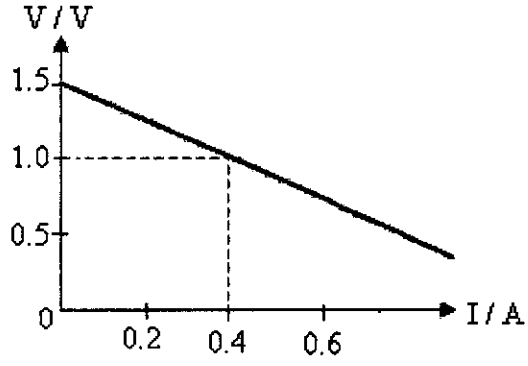
A the ammeter reading increases
bacaan ammeter bertambah

B the voltmeter reading increases
bacaan voltmeter bertambah

C the ammeter reading decreases
bacaan ammeter berkurang

D no change in readings on both meters
tiada perubahan bacaan bagi kedua-dua meter

34. Diagram shows a potential difference, V against current, I graph.
Rajah menunjukkan graf beza keupayaan,V, melawan arus, I,.



What is the internal resistance of the cell?
Berapakah rintangan dalam bagi sel itu?

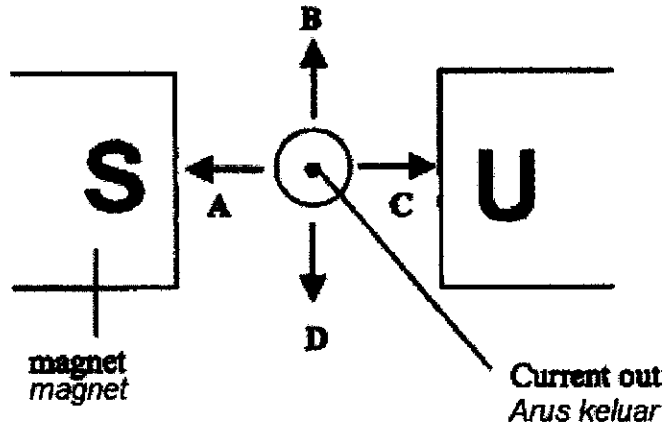
A 2.40 Ω

B 1.50 Ω

C 1.25 Ω

D 0.40 Ω

35. The diagram shows a current-carrying conductor placed between two magnetic poles.
Gambar rajah menunjukkan satu konduktor berarus di antara dua kutub magnet.



Based on the directions **A**, **B**, **C** and **D**, which shows the motion direction of the conductor?
Berdasarkan arah **A, B, C** *and* **D**, *yang manakah adalah arah gerakan bagi konduktor tersebut?*

36. Diagram shows a plotting compass placed beside a current-carrying wire.
Rajah menunjukkan sebuah kompas diletakkan di sebelah suatu dawai yang mengalirkan arus elektrik.

Which compass pointer shows the correct direction?
Jarum kompas yang manakah menunjukkan arah yang betul?

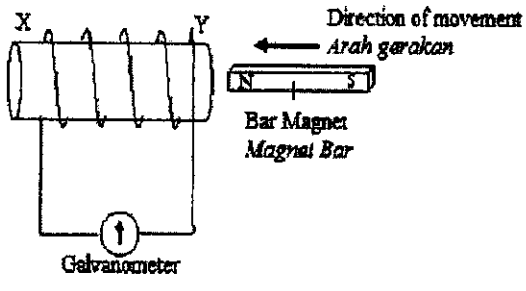
A

B

C

D

37. Diagram shows a bar magnet is moving towards a solenoid.
Rajah menunjukkan satu magnet bar digerakkan mendekati gegelung.



What is the magnetic polarity at both ends of the solenoid, X and Y?
Apakah kutub medan magnet pada kedua-dua hujung solenoid, X dan Y?

	X	Y
A	South *Selatan*	South *Selatan*
B	South *Selatan*	North *Utara*
C	North *Utara*	North *Utara*
D	North *Utara*	South *Selatan*

38. The motion of a current carrying conductor in an magnetic fields can be determined by
Gerakan konduktor yang membawa arus dalam medan magnet boleh ditentukan oleh

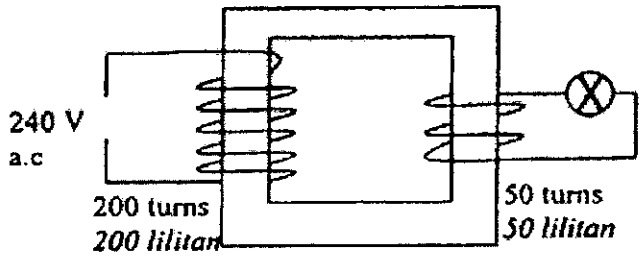
A Direction of current flow
Arah arus mengalir

B Fleming's Right Hand Rule
Petua Tangan Kanan Fleming

C Fleming's Left Hand Rule
Petua Tangan Kiri Fleming

D Right hand Grip Rule
Petua Genggaman Tangan Kanan

39. Diagram shows a transformer that is used to light up a bulb.
Rajah menunjukkan sebuah transformer yang digunakan untuk menyalakan sebiji mentol.



Which of the following statements is true about the transformer?
Antara pernyataan-pernyataan yang berikut, yang manakah benar tentang transformer itu?

	Type of transformer ***Jenis transformer***	**Voltage across the bulb** ***Voltan merentasi*** **mentol**
A	Step-up *Injak naik*	480 V *480 V*
B	Step-up *Injak naik*	960 V *960 V*
C	Step-down *Injak turun*	41.7 V *41.7 V*
D	Step-down *Injak turun*	60 V *60 V*

40. Which of the following is the characteristic of the National Grid Network in electricity transmission?
Manakah yang berikut adalah ciri Rangkaian Grid Nasional dalam penghantaran tenaga elektrik?

A When one power station breaks down, the whole country's electricity supply will be affected.
Apabila sebuah stesen kuasa rosak, keseluruhan bekalan elektrik negara akan terganggu.

B During non peak hours of electricity usage, the operation of some power stations can not be stopped for repair and maintenances purposes.
Semasa penggunaan elektrik pada bukan waktu puncak, sebahagian stesen kuasa tidak boleh diberhentikan untuk tujuan pembaikkan dan penyelenggaraan.

C During non peak hours, some power stations can be closed to cut cost.
Semasa bukan waktu puncak, sebahagian stesen kuasa boleh ditutup untuk menjimatkan kos.

D During peak hours of electricity usage, the electricity can be transmitted at low potential difference.
Semasa penggunaan elektrik pada waktu puncak tenaga elektrik boleh diagihkan pada beza keupayaan rendah.

41. Which of the following electronic components can store charge and also smoothen the output current of a rectification circuit?
Manakah komponen elektronik yang berikut boleh menyimpan cas dan sebagai perata arus dalam litar rektifikasi?

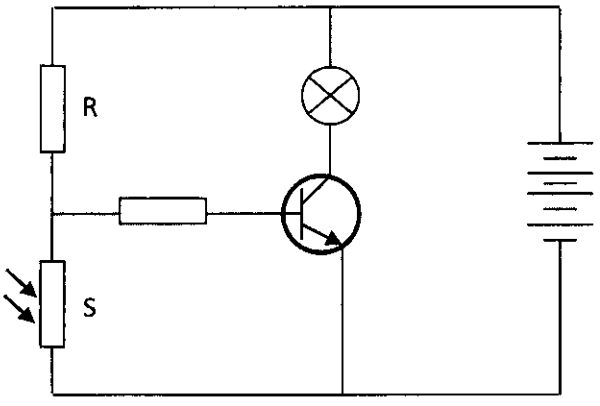
A Resistor
Perintang

B Diode
Diod

C Capacitor
Kapasitor

D Thermistor
Termistor

42. Diagram shows a transistor switching circuit with a light dependent resistor.
Rajah menunjukkan litar pensuisan transistor dengan sebuah perintang peka cahaya.



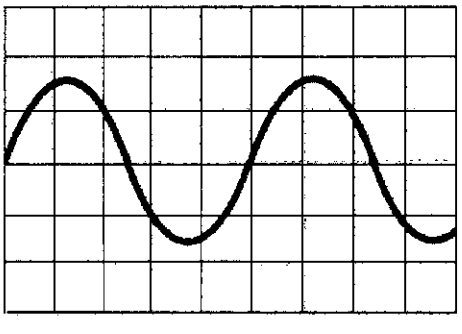
The bulb will light up when
Mentol akan menyala apabila

A Resistance S more than R
Nilai rintangan S *lebih besar dari* R

B Resistance R more than S
Nilai rintangan R *lebih besar dari* S

C The position R and S is exchange
Kedudukan R *dan* S *saling di tukarkan*

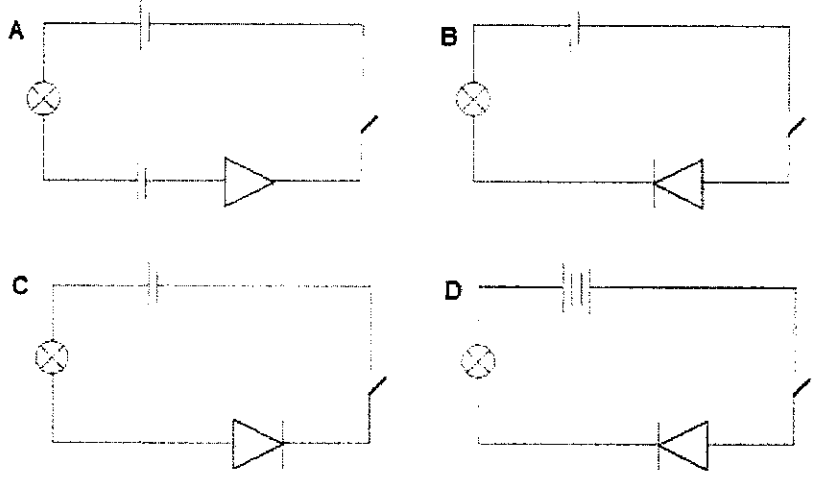
43. Diagram shows the trace on a Cathode Ray Oscilloscope (CRO) screen.
Rajah menunjukkan surih di atas skrin Osiloskop Sinar Katod (OSK).



The Y-gain and the time-base are set at 3 volt / division and 5 ms / division respectively. What is the peak voltage and the frequency of the alternating current supply that connected to the C.R.O?
Gandaan-Y dan dasar masa telah disetkan pada 3 volt / bahagian dan 5 ms / bahagian masing-masing. Apakah voltan puncak dan frekuensi arus ulang alik yang disambungkan ke OSK?

	Peak voltage / V *Voltan puncak /*	**Frequency / Hz** *V Frekuensi / Hz*
A	9.0	40
B	4.5	40
C	9.0	0.04
D	4.5	0.04

44. The diagrams show a circuit consisting of a diode and a bulb and betteries. When the switch is on which of the bulb in the diagram to light up?
Rajah menunjukkan satu litar yang mengandungi diod, mentol dan bateri. Mentol manakah yang akan menyala apabila suis ditutup?



45. The atoms of two isotopes of the same element have different number of ..... .
Atom bagi isotop-isotop daripada dua unsur yang sama mempunyai bilangan ..... yang berbeza.

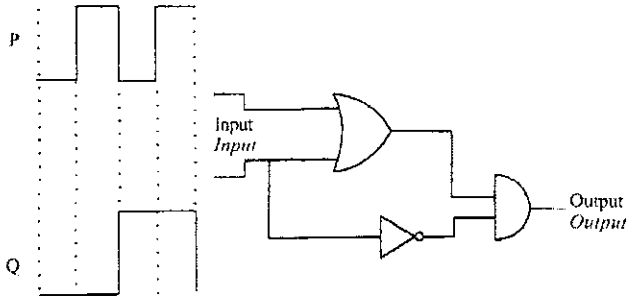
A electrons
elektron

B neutrons
neutron

C protons
proton

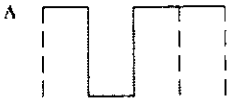
D electrons and protons
elektron dan proton

46. Diagram shows a combination of three logic gates. Signal P and signal Q are supplied to the input.
Rajah menunjukkan satu kombinasi bagi tiga get logik. Isyarat P *dan* isyarat Q *dibekalkan kepada input.*



Which output signal is correct?
Isyarat output manakah yang betul?

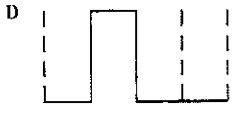
A



B

C

D



47. Which radioisotope is most suitable to be injected into the body for the radioactive imaging of an organ?
Radioisotop yang manakah paling sesuai untuk disuntik ke dalam badan bagi tujuan pengimejan radioaktif sesuatu organ?

	Radioisotope *Radioisotop*	Half-life *Setengah Hayat*	Radiation emitted *Sinaran yang dikeluarkan*
A	P	6 hours *6 jam*	Low energy gamma rays *Sinar gamma bertenaga rendah*
B	Q	48 hours *48 jam*	High energy beta particles *Zarah beta bertenaga tinggi*
C	R	24 days *24 hari*	Low energy alpha particles *Zarah alfa bertenaga rendah*
D	S	138 days *138 hari*	High energy gamma ray *Sinar gama bertenaga tinggi*

48. The rate meter on one G-M tube shows a background radiation of 40 counts per minute. When a radioactive material is placed in front of the G-M tube, the meter rate records 150 counts per minute. After 6 hours, the meter reading rate becomes 67.5 counts per minute. Determine the half-life of the radioactive material.
Meter kadar pada satu tiub G-M mencatatkan sinaran latar belakang 40 *bilangan per minit. Apabila satu bahan radioaktif diletakkan di hadapan tiub G-M, meter kadar mencatatkan* 150 *bilangan per minit. Selepas* 6 *jam, bacaan meter kadar menjadi* 67.5 *bilangan per minit. Tentukan separuh hayat bahan radioaktif itu.*

A 1 hours
1 *jam*

B 2 hours
2 *jam*

C 3 hours
3 *jam*

D 6 hours
6 *jam*

49. The equation shows the decay of uranium-235.
Persamaan berikut menunjukkan reputan uranium-235.

$$^{235}_{92}\mathrm{U} \rightarrow {}^{231}_{90}\mathrm{Th} + {}^{4}_{2}\mathrm{He}$$

What is the mass that is converted to energy?
Berapakah jisim yang ditukarkan kepada tenaga?
[Mass of uranium-235
jisim uranium-235 = 235.0439 u,
mass of thorium-231
jisim torium-231 = 231.0363 u,
mass of alpha particle
jisim zarah alfa = 4.0026 u]

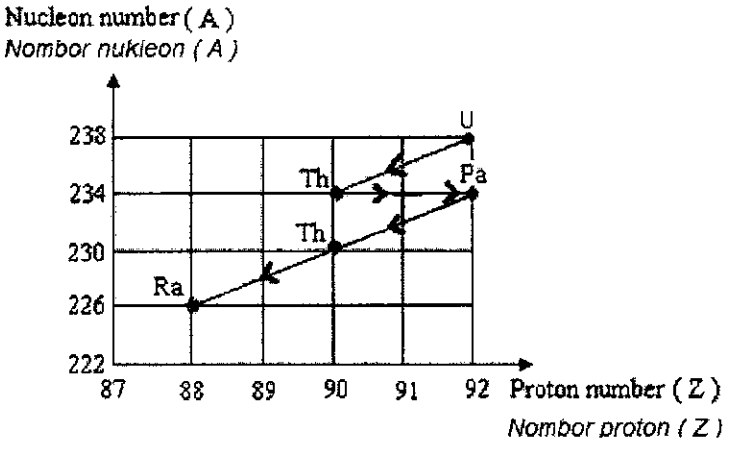
A 0.0025 u

B 0.0050 u

C 0.0060 u

D 0.0075 u

50. Diagram shows a series of radioactive decays for the nucleus of uranium-238 to that radium-226.
Rajah menunjukkan siri pereputan radioaktif nucleus uranium-238 kepada nucleus radium-226.



What is the number of the alpha particles and beta particles emitted during this process?
Berapakah bilangan zarah alfa dan zarah beta yang dihasilkan semasa proses ini?

	The number of alpha particles ***Bilangan zarah alfa***	**The number of beta particles** ***Bilangan zarah beta***
A	2	3
B	2	6
C	3	2
D	6	2